



MACT Training

Subpart YYYYY – Combustion Turbines


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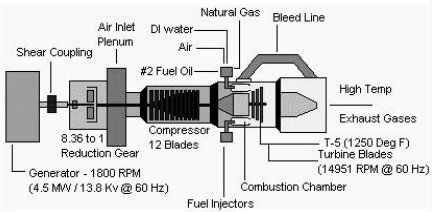
Overview


- ★Pretest
- ★Turbines overview
- ★Applicability
- ★Compliance Requirements
- ★Proposed delisting & stay
- ★NE sources
- ★Post test



Combustion Turbines

- ★Aircraft engines designed for ground use
- ★Use clean fuels (natural gas & distillate oil)




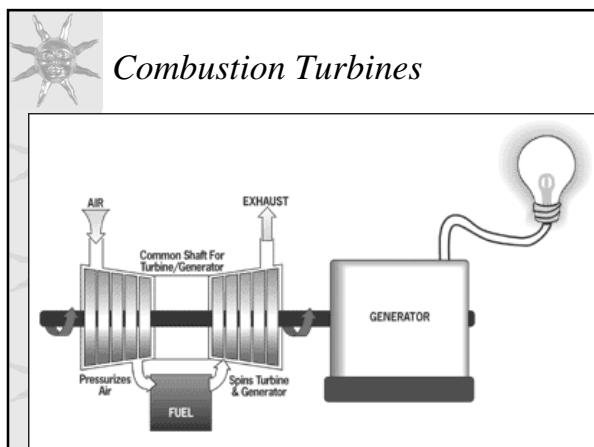



Combustion Turbines

★ 3 main components

- **Compressor** – incoming air compressed to high pressure
- **Combustor** – fuel is burned producing high pressure, high-velocity gas
- **Turbine** – energy extracted from combustor








Combustion Turbines

★ Temperature is limited to design

★ Diffusion flame

- Easy to build
- Fuel & air enter combustion chamber separately
- Makes more NO_x due to higher temperatures





Combustion Turbines

★Premix

- Newer technology
- Natural gas-fired only
- Fuel & air mixed prior to entering combustion chamber
- Limits flame temperature and residence time at peak flame temperature
- Less NO_x due to lower temperatures



Combustion Turbine MACT

★Proposal 1/14/03

★Final 3/5/04

★Subpart YYYY

★40 CFR Part 63.6080





Applicability

★Major Source of HAP

- ≥ 10 & 25 tpy of HAPs

★Existing Source

- Constructed/reconstructed on or before 1/14/03

★New Source

- Constructed/reconstructed after 1/14/03
- Change in ownership doesn't make it new



Limited Requirements

- ★ Submit initial notification only
 - New/reconstructed
 - Emergency Generators
 - Located on North Slope of Alaska
- ★ Initial notification & some monitoring & reporting
 - Turbines burning MSW landfill gas or digester gas



Limited Requirements

- ★ Exempt from Subpart YYYYY
 - All turbines < 1.0 MW
 - Individually, not combined
 - **All existing sources**
 - Duct burners & waste heat recovery units
- ★ Exempt from this Subpart, may be subject to others
 - Engine test cells/stands





Compliance

- ★ New/reconstructed startup prior to 3/5/04
 - Comply no later than 3/5/04
- ★ New/reconstructed startup after 3/5/04
 - Comply upon startup
- ★ Area source that becomes major
 - Comply when it becomes major





Emission Limit

- ★ Limit concentration of formaldehyde to 91 ppbvd or less at 15% O₂





Emission Control

- ★ Diffusion flame uses catalytic oxidizer
 - 85-90% control
 - CO, good surrogate
 - Can't use on landfill/digester gas units
- ★ Lean premix
 - Emissions comparable to diffusion flame with catox
 - NO_x good surrogate



Performance Tests

- ★ If already performed before rule & want to use results
 - Same methods
 - Test not older than two years
 - Reviewed & accepted by Administrator
 - No process or equipment changes
 - Load condition at $\pm 10\%$ of 100%



Performance Tests

★ Due 180 days after compliance date

★ Establish

- Formaldehyde concentration
- O₂ concentration
- Moisture content



★ Submit results with Notification of Compliance Status



Monitoring

★ Using oxidation catalyst

- Maintain at mfg. recommended temperature
- Continuously monitor inlet temp

★ Not using oxidation catalyst

- Continuously monitor other parameters approved by Administrator






Monitoring

★ Landfill/Digester Gas

- Monitor & record daily fuel usage with separate fuel meters


★ Lean premix or diffusion flame burning oil


- Monitor daily fuel usage with non-resettable hour meter
- Applies to all turbines at a source with subject turbines
 - New & existing turbines



Demonstrating Compliance


- ★Initial
 - Meet average formaldehyde emission limit
 - Submit Compliance Status Notification






Demonstrating Compliance


- ★Continuous
 - Oxidation catalyst
 - Monitor temperature continuously and maintain 4 hour rolling average of mfg. Recommendation
 - Other
 - Approved by Administrator
 - Report deviations semiannually
 - Comply with Startup, Shutdown, Malfunction Plan





Startup, Shutdown, Malfunction Plan (SSM)

- ★General Provisions
 - 63.6(e)(3)
- ★Procedures for operating during SSM
- ★If action taken doesn't follow SSM Plan
 - Report within 2 working days
 - Followed by letter 7 working days after event
- ★Kept on site & revisions reported in semi-annual report





Notifications

★Initial Notification

- Submit 120 days after 3/5/04 (7/6/04) or 120 days after startup
- If you only have to submit an initial notification
 - Must state that it is your only requirement
 - Include why it is your only requirement (emergency generator)



Notifications



★Performance test

- Notification of intent 60 days prior to test

★Compliance Status Notification

- Include performance test results
- Due 60 days after performance test




Reports


★Semi-annual Compliance Report

- Operating time for each turbine
- Deviations information
- 1st one 7/31 or 1/31, whichever comes first after compliance date & every 6 months thereafter
- Can be the same timeframe for Title V reports






Reports





- ★ Annual Landfill/Digester Gas Report
 - Fuel flow rate & heating Value
 - Any operating limits from permit
 - Deviations & problems with meters
 - 1st one begin on compliance date & end on 12/31 & every 12 months thereafter
 - Can be same timeframe for Title V reports




Records

- ★ Copy of each notification & report
- ★ Performance test records
- ★ Startup, shutdown, malfunction records
- ★ All maintenance of control equipment





Records



- ★ Landfill/digester gas & distillate oil burned
 - Daily fuel usage
- ★ Operating limits & parameters
- ★ **Keep on site for 5 years**



Proposed Delisting & Stay

- ★4/7/04 - Proposal to delist combustion turbine source categories
 - Lean premix firing gas & oil < 1,000 hours
 - Diffusion flame firing gas & oil < 1,000 hours
 - Emergency stationary turbines
 - Located on North Slope of Alaska.
- ★Proposal to stay the effectiveness of rule
 - Lean premix & diffusion flame firing natural gas



Final Rule on Stay



- ★8/18/04
- ★Don't have to comply with emission or operating limits
- ★Must still submit initial notification
 - Lean premix firing gas & oil < 1,000 hours
 - Diffusion flame firing gas & oil < 1,000 hours



Formaldehyde Risk Factor



- ★EPA used unit risk factor # from the Chemical Institute not IRIS
- ★New studies showing # should be 2-5 times higher than Chemical Institute
- ★ORD sending to SAB for review
- ★May not be new # for 2 years
- ★Delisting won't occur until new # is known



NE Sources

- ★Fremont Utilities (Lon D. Wright)
 - Dual Fuel unit – mostly natural gas used
 - 40 MW
- ★Very possible to have new units in the future





Questions?

- ★Melissa Woolf
 - 471-6624
- ★EPA's Website
 - www.epa.gov/ttn/atw/turbine/turbinepg.html
- ★MACT Notebook Information